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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/079,906

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Hitoshi Narusawa

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21171

7590

10/06/2006

STAAS & HALSEY LLP

SUITE 700

1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER

MEI, XU

ART UNIT

PAPER NUMBER

2615

DATE MAILED: 10/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/079,906	NARUSAWA, HITOSHI	
	Examiner	Art Unit	
	Xu Mei	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,3,5 and 7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,3,5 and 7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is responsive to the applicant's amendment dated 07/17/2006.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Terry et al. (Hereinafter "Terry") (US Patent 5,388,185) in view of Kandel et al. (Hereinafter "Kandel") (US Patent 6,353,671) and further in view of "Speech Recognition System", 1 September 1970, IBM Technical Disclosure Bulletin, Vol. 13, Issue 4, pages 828-831, (Hereinafter "IBM").

Regarding Claim 2, Terry discloses an acoustic processor (Fig. 2), comprising: an input unit into which acoustic signals are input (Analog input 10); a detector detecting a frequency band having a highest energy level among frequency bands comprising the acoustic signals input into the input unit (spectral analysis and formant extraction 42 and 44; Col. 6, lines 41-55). Although Terry discloses increasing the amplification degree at frequencies higher than the first formant to improve speech intelligibility (Col. 6, lines 41-55), Terry does not disclose maintaining the energy level of the acoustic signals

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substantially constant for frequency bands lower than the first formant or a 6 dB/octave filter. Kandel discloses a processor for increasing speech intelligibility including an amplifier which also amplifies second formants (i.e. higher frequency bands) without passing the first formant (Col. 9, lines 5-9). Kandel (Fig. 2) discloses a variable frequency response where low frequencies (i.e. lower than first formant) maintained at a constant level to increase speech intelligibility (Col. 5, lines 57-60). Kandel also discloses a variable equalizer with variable gain (Col. 9, lines 5-23) and able to amplify a limited frequency range (second formant frequency) and the limitation of the frequency range is variable (i.e., the variable second formant frequency range). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a variable frequency response which maintains energy lower than the first formant and increase gain higher than the first formant to increase speech intelligibility as taught by Kandel.

Terry/Kandel do not disclose a 6 dB/octave high pass filter characteristic. IBM discloses a speech recognition system which also emphasizes higher formants. IBM discloses a filter shown in drawing B which rises at 6 db/octave to help raise the amplitude of the second format above that of the first formant (Paragraph bridging pages 2 and 3). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a filter of 6 db/octave in order to help raise the second format above the first format (i.e. higher frequency bands) as taught by IBM to increase second formants and increase speech intelligibility.

4. Claims 3, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry et al. (Hereinafter "Terry") (US Patent 5,388,185) in view of Kandel et al. (Hereinafter "Kandel") (US Patent 6,353,671).

Regarding Claim 3, Terry discloses an acoustic processor (Fig. 2), comprising: an input unit into which acoustic signals are input (Analog input 10); a detector detecting a frequency band having a highest energy level among frequency bands comprising the acoustic signals input into the input unit (spectral analysis and formant extraction 42 and 44; Col. 6, lines 41-55). Although Terry discloses increasing the amplification degree at frequencies higher than the first formant to improve speech intelligibility (Col. 6, lines 41-55), Terry does not disclose maintaining the energy level of the acoustic signals substantially constant for frequency bands lower than the first formant or a delay. Kandel discloses a processor for increasing speech intelligibility including an amplifier which also amplifies second formants (i.e. higher frequency bands) without passing the first formant (Col. 9, lines 5-9). Kandel (Fig. 2) discloses a variable frequency response where low frequencies (i.e. lower than first formant) maintained at a constant level to increase speech intelligibility (Col. 5, lines 57-60). Kandel also discloses a variable equalizer with variable gain (Col. 9, lines 5-23) and able to amplify a limited frequency range (second formant frequency) and the limitation of the frequency range is variable (i.e., the variable second formant frequency range). Kandel further discloses a circuit (122) which will inherently have a delay for the input acoustic signal to the amplifier (i.e. variable equalizer) 114. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a variable frequency response which

maintains energy lower than the first formant and increase gain higher than the first formant to increase speech intelligibility as taught by Kandel.

Regarding Claim 5, Terry discloses an acoustic processor (Fig. 2), comprising: an input unit into which acoustic signals are input (Analog input 10); a detector detecting a frequency band having a highest energy level among frequency bands comprising the acoustic signals input into the input unit (spectral analysis and formant extraction 42 and 44; Col. 6, lines 41-55). Although Terry discloses increasing the amplification degree at frequencies higher than the first formant to improve speech intelligibility (Col. 6, lines 41-55), Terry does not disclose maintaining the energy level of the acoustic signals substantially constant for frequency bands lower than the first formant or a shift in the variable equalizer. Kandel discloses a processor for increasing speech intelligibility including an amplifier which also amplifies second formants (i.e. higher frequency bands) without passing the first formant (Col. 9, lines 5-9). Kandel (Fig. 2) discloses a variable frequency response where low frequencies (i.e. lower than first formant) maintained at a constant level to increase speech intelligibility (Col. 5, lines 57-60). Kandel also discloses a variable equalizer with variable gain (Col. 9, lines 5-23) and able to amplify a limited frequency range (second formant frequency) and the limitation of the frequency range is variable (i.e., the variable second formant frequency range). Kandel et al. further discloses the rise frequency of the variable equalizer shifts to a low frequency side as the energy level of the input acoustic signals decreases (Figure 2 discloses the frequency decreasing (low frequency side) as the acoustic gain decreases

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between 360 and 1440 Hz), and the rise frequency of the variable equalizer shifts to a high frequency side as the energy level of the input acoustic signals increases (Figure 2 discloses the frequency increasing (high frequency side) as the acoustic gain increases between 360 and 1440 Hz). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a variable frequency response which maintains energy lower than the first formant and increase gain higher than the first formant to increase speech intelligibility as taught by Kandel.

Regarding Claim 7, it is inherent that the equalizer will have a response time of 5 msec for a signal of (1sec/.005 sec) 200 Hz (i.e. high frequency side) from the frequency band detected by the detector and a response time of 10 msec for a signal of (1sec/0.01sec) 100 Hz (i.e. low frequency side) from the frequency band detected by the detector in order to process the audio signals.


Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xu Mei whose telephone number is 571-272-7523. The examiner can normally be reached on maxi flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Xu Mei
Primary Examiner
Art Unit 2615
09/25/2006